

WHAT IS CLAIMED IS:

1. An aqueous coating composition for making an ink-jet recording medium, comprising a dispersion of: a) at least 60% by weight of cationic fumed silica particles, and b) at least 14% by weight of cationic polyurethane resin based on total weight of solids in the composition.
2. The coating composition of claim 1, comprising: a) about 60% to about 86% by weight of cationic fumed silica particles, and b) about 14% to about 40% by weight of cationic polyurethane resin.
3. The coating composition of claim 1, further comprising a water-soluble polymer selected from the group consisting of cationic acrylic polymers and copolymers, acrylic/acrylamide copolymers, polyvinyl alcohol/N-vinylformamide copolymers, and acrylamide polymers.
4. The coating composition of claim 1, further comprising a water-dispersible polymer selected from the group consisting of cationic acrylic polymers and copolymers, cationic styrene/acrylic copolymers, and cationic polystyrene latexes.
5. The coating composition of claim 1, further comprising an additive selected from the group consisting of pigments, surface active agents, anti-static agents, optical brighteners, UV light stabilizers, UV absorbers, defoaming agents, humectants, waxes, and plasticizers.
6. The coating composition of claim 1, wherein the silica particles are primary particles having an average particle size in the range of about 3 nm to about 40 nm.
7. The coating composition of claim 1, wherein the silica particles comprise about

99.5% by weight silica and about 0.005% to about 0.5% by weight alumina.

8. The coating composition of claim 1, wherein the composition has a pH in the range of about 3.0 to about 7.0.
9. The coating composition of claim 1, wherein the composition has a zeta potential of at least 20 mV.
10. An ink-jet recording medium, comprising a substrate coated with an ink-receptive layer comprising: a) at least 60% by weight of cationic fumed silica particles, and b) at least 14% by weight of cationic polyurethane resin based on total dry weight of the ink-receptive layer.
11. The ink-jet recording medium of claim 10, wherein the substrate is a paper.
12. The ink-jet recording medium of claim 11, wherein the substrate is a porous paper having water absorption as measured per a Cobb TAPPI Test Method T441 in one minute in the range of about 20 to about 100.
13. The ink-jet recording medium of claim 11, wherein the paper is a matte paper having a gloss in the range of about 2 to about 10.
14. The ink-jet recording medium of claim 11, wherein the paper has a base weight in the range of about 70 to about 260 g/m².
15. The ink-jet recording medium of claim 10, wherein the weight of the ink-receptive layer is in the range of about 5 to about 40 g/m².
16. An ink-jet recording medium, comprising a substrate coated with a) an ink-receptive underlayer comprising a pigment and a polymer selected from the group consisting of a water-soluble and water dispersible polymer, and b) an ink-

receptive top layer comprising: a) at least 60% by weight of cationic fumed silica particles, and b) at least 14% by weight of cationic polyurethane resin based on total dry weight of the top layer.

17. The ink-jet recording medium of claim 16, wherein the ink-receptive underlayer comprises pigment and a water-soluble polymer selected from the group consisting of poly(vinyl alcohol), poly(vinyl pyrrolidone); poly(2-ethyl-2-oxazoline), modified starch cellulose; and cellulose derivatives, and mixtures thereof.
18. The ink-jet recording medium of claim 16, wherein the ink-receptive underlayer comprises polyvinyl alcohol and silica.
19. The ink-jet recording medium of claim 16, wherein the ink-receptive underlayer comprises pigment and a water-dispersible polymer selected from the group consisting of acrylates; methacrylates; polyvinyl acetate; vinyl acetate copolymers, polystyrene; styrene copolymers; polyesters; vinyl-acrylic terpolymers, polyacrylonitrile; acrylonitrile copolymers, polyurethanes; and mixtures thereof.
20. The ink-jet recording medium of claim 16, wherein the substrate is a paper.
21. The ink-jet recording medium of claim 16, wherein the weight of the ink-receptive underlayer is in the range of about 5 to about 20 g/ m² and the weight of the ink-receptive top layer is in the range of about 5 to about 40 g/ m².
22. The ink-jet recording medium of claim 16, wherein the paper is a substantially impermeable paper having a polymeric moisture barrier coating.
23. The ink-jet recording medium of claim 16, wherein the substrate is a polymeric film comprising a polymer selected from the group consisting of polyesters,

polycarbonates, polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyacrylics, polyacetals, ionomers, and mixtures thereof.

24. The ink-jet recording medium of claim 16, wherein the substrate is a metal foil.
25. The ink-jet recording medium of claim 16, wherein the substrate is a metal-coated material.
26. A method of making an ink-jet recording medium, comprising the steps of:
 - a) coating a substrate with an ink-receptive underlayer comprising a pigment and polymer selected from the group consisting of water-soluble and water-dispersible polymers, and drying the underlayer; and
 - b) coating an ink-receptive top layer over the underlayer, said top layer comprising an aqueous dispersion of: a) at least 60% by weight of cationic fumed silica particles, and b) at least 14% by weight of cationic polyurethane resin based on total weight of solids in the dispersion, and drying the top layer.
27. The method of claim 25, wherein the ink-receptive layers are applied using a Meyer-rod, slot-die, roller, blade, wire bar, dip, solution extrusion, reverse roll, air-knife, curtain slide, doctor-knife, and gravure method.
28. The method of claim 25, wherein the ink-receptive top layer is not calendered, said top layer having a surface gloss of 10 or greater.
29. The method of claim 25, wherein the ink-receptive top layer is calendered, said top layer having a surface gloss of 20 or greater.